Appliance Standards Awareness Project
Air Movement and Control Association

February 25, 2015

Ms. Brenda Edwards
U.S. Department of Energy
Building Technologies Program
Mailstop EE-5B
1000 Independence Avenue, SW
Washington, DC 20585

RE: Docket Number EERE–2013–BT–STD–0006/ RIN 1904–AC55: **Notice of Data Availability for Commercial and Industrial Fans**

Dear Ms. Edwards:

This letter constitutes joint comments from the Appliance Standards Awareness Project (ASAP) and Air Movement and Control Association (AMCA) on the notice of data availability (NODA) for commercial and industrial fans. 79 Fed. Reg. 73246 (December 10, 2014).

Fan manufacturers and efficiency advocates (ASAP, ACEEE, CA IOUs, NRDC, and NEEA) have been working to jointly develop a proposed approach for energy conservation standards for commercial and industrial fans. Under our proposed approach, manufacturers would certify to DOE the operating points (flow and pressure) at which a given fan complies with the standard along with the fan's rated maximum speed (i.e. the maximum speed at which the fan complies with the standard at one or more operating points). Manufacturers would be able to offer fans for sale only at those operating points that meet the standard. We believe that our proposed approach could result in significantly greater energy savings than the approach outlined in the NODA by addressing fan selection and helping to shift customer purchases towards fans that are efficient for the customer's particular application.

Below we outline a number of high-level issues related to establishing standards for commercial and industrial fans and describe those areas where AMCA and efficiency advocates have reached tentative agreement as well as issues that we have discussed but where we have not yet reached tentative agreement.

<u>Scope of Coverage and Equipment Classes</u>

We have tentatively agreed that the scope of coverage for this rulemaking should include fans from 1-200 horsepower. However, we have not yet reached a joint position on how the horsepower of a fan should be calculated in order to determine whether a given fan falls within the horsepower range.

We have tentatively agreed that there should be two equipment classes: one for ducted fans (fans normally ducted on their discharge) and one for non-ducted fans (fans normally not ducted on their discharge).

We have also tentatively agreed that the following fan types should be included in the scope of coverage:

Ducted

- Housed Centrifugal Backward Bladed
- Housed Centrifugal Forward Bladed
- Housed Centrifugal Radial Bladed
- Mixed Flow
- In-line Centrifugal
- Vane Axial
- Tube Axial

Non-Ducted

- Axial Powered Roof and Wall Ventilator
- Centrifugal Powered Roof and Wall Ventilator
- Panel Fans
- Unhoused Centrifugal

We believe that it likely will be appropriate to exclude certain types of fans from the scope of coverage. While we have discussed a few possible exemptions, we have not yet reached final agreement on specific fan types to exclude from the scope of coverage. Fans that should be evaluated and discussed for potential exemption include: jet fans, high temperature fans, spark resistant fans, induced flow fans, fans using an unshrouded radial impeller, exhaust fans certified under the BESS program, circulating fans, air curtains, and crossflow fans.

Test Procedures

We have tentatively agreed that the test procedures should be based on AMCA 210.

Efficiency Metric

We have tentatively agreed that the efficiency metric should be based on total efficiency for ducted fans and static efficiency for non-ducted fans. We have also tentatively agreed that the metric for standards should be fan efficiency ratio (FER), which was developed by AMCA. FER is an index that compares either the efficiency of a given fan to the minimum required efficiency or the power consumption of a given fan to the maximum allowable power consumption. In the case where FER is calculated using power (rather than efficiency), the maximum allowable power consumption would be calculated as:

$$Maximum\ allowable\ power\ consumption = \frac{(Q + Q_0)(P + P_0)}{6343 \times \eta_{target}}$$

where Q is flow, P is pressure, and Q_0, P_0, and η_{target} are constants.

As noted above, we have tentatively agreed that the pressure (P) and target efficiency (η_{target}) should be based on total pressure and total efficiency for ducted fans, and static pressure and static efficiency for non-ducted fans. We have discussed potential values for the constants, but have not yet reached agreement on the constants.

Standard Levels

Improved fan efficiency is generally cost-effective for fan users across a broad range of potential efficiency levels. Therefore, we believe that a key factor in selecting a standard level will be impact on the fan market. We encourage DOE to evaluate standard levels based on incrementally greater market impact (e.g. levels which result in 5%, 10%, 15%, 20%, 25%, 30%, 40% and 50% of fan selections to become non-compliant based on the most current sales data). This information will help stakeholders understand the tradeoffs between energy savings achieved and impacts on manufacturers and their customers.

Wire-to-Air Efficiency and Extended Products

We believe that there would be value in having the efficiency metric be based on wire-to-air efficiency in order to capture the power consumption of motors, transmission, and controls. We also believe that significant additional energy savings could be achieved if a wire-to-air efficiency metric could encourage the increased adoption of "extended products" and, in particular, fans that have variable-speed capability. We have not yet reached a joint position on how a wire-to-air metric should be constructed, but we believe that this concept should be further explored.

Certification

We have tentatively agreed that for each fan basic model, manufacturers would certify to DOE the operating points (flow and pressure) at which the fan complies with the standard along with the fan's rated maximum speed (i.e. the maximum speed at which the fan complies with the standard at one or more operating points).

Marketing

We are discussing how marketing materials will limit the manufacturer's offer to sell fans for design points that are only within the compliant range. All descriptive literature and software that facilitate selection must clearly and obviously identify the compliant regulated selection range of the fan. We have tentatively agreed that selection tables in product catalogs would include only the compliant range of flow and pressure conditions, and fan selection software would return only compliant fans given the input design conditions.

Labeling

We believe that it makes sense to establish a labeling or marking requirement for fans. We have discussed that it may be necessary to establish different labeling or marking requirements depending on whether the manufacturer knows the customer's design point. We have also discussed that nameplates should include the fan's maximum rated speed and information on how to access documentation of compliant selection points for that fan. If the design point is known at the time of manufacture, the nameplate should include that fan's FER at the design point.

Additional Programs and Policies to Drive Fan Energy Savings

We have a mutual interest in developing an efficiency metric for fans that will facilitate complementary efforts to drive fan energy savings including utility programs, building codes, building rating systems, and federal purchasing requirements. We anticipate and intend that DOE standards will provide a rating system platform that will facilitate additional efforts to promote fan efficiency. Stakeholders involved in our discussions intend to work together to advance related efforts to further promote fan efficiency beyond DOE standards.

Thank you for considering these comments, and we look forward to continuing to work with DOE to develop energy conservation standards for commercial and industrial fans.

Sincerely,

Andrew deLaski
Executive Director
Appliance Standards Awareness Project

Wade W. Smith
Executive Director
AMCA International